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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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1. NAME OF INVENTOR  
2. ADDRESS OF INVENTOR  
3. CITY AND STATE OF INVENTOR  
4. NAME OF ATTORNEY  
5. ADDRESS OF ATTORNEY  
6. CITY AND STATE OF ATTORNEY

EXAMINER
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ART UNIT	PAPER NUMBER
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DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/045,507

Applicant(s)

Macintyre

Examiner

Douglas Wille

Group Art Unit

2814



X Responsive to communication(s) filed on *Aug 9, 1999*

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

X Claim(s) *4, 6, 7, 15, and 17*

is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

Claim(s) \_\_\_\_\_ is/are allowed.

X Claim(s) *4, 6, 7, 15, and 17*

is/are rejected.

Claim(s) \_\_\_\_\_ is/are objected to.

Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

The proposed drawing correction, filed on \_\_\_\_\_ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some\* None of the CERTIFIED copies of the priority documents have been received.

received in Application No. (Series Code Serial Number)

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s):

Interview Summary, PTO-413

SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 4, 6, 7, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Tsukamoto and Igarashi et al.

3. Lin shows a flip chip device (see Figure 5 and column 5, line 15) with a semiconductor chip 12 attached to an interposer board 22. Lin shows the interposer board attached to a PCB board with layer of adhesive 36 but does not show a similar attachment between 12 and 22.

noting that while it is standard practice (column 2, line 22) it prevents rework. Note that if rework is not an issue, bonding is recommended. Lin also teaches that the thermal coefficient of expansion of the interposer should match that of the die (column 6, line 28). Lin shows vias 24 in the plate 22 with evaporated traces 26 (column 6, line 64) on the plate which connects contacts 16 to vias 24 and solder beads 32 are formed on the surface of 22. Lin shows that the metallization 26 can be evaporated and if performed after forming the hole it will extend into the holes. In addition a conductive fill is used for the vias (column 6, line 66). Lin does not specify the material of the plate 2 but Tsukamoto shows a similar structure where the plate is a glass ceramic which will match the CTE of the die. Igarashi et al. show the use of epoxy to bond the die to the

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ceramic plate taught by Tsukamoto to match the TCE of the die and plate and to use the polyimide bond taught by Igarashi et al. to have a known bonding material.

***Conclusions***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.
5. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose number is (703) 308-0956.



Olik Chaudhuri  
Supervisory Patent Examiner  
Art Unit 2814

DAW : 40

September 15, 1999